

Precompressed Gas Diffusion Layers for Electrochemical Cells

Abstract

A method is provided for making a gas diffusion layer (GDL) for an

5 electrochemical cell comprising the steps of coating a surface of a plain-weave carbon fiber cloth with a layer comprising carbon particles and one or more highly fluorinated polymers to make a coated plain-weave carbon fiber cloth, and compressing the coated plain-weave carbon fiber cloth to a compression of 25% or greater. Typically the GDL according to the present invention can be incorporated into a membrane electrode

10 assembly (MEA) comprising a very thin polymer electrolyte membrane (PEM), typically having a thickness of 50 microns or less, without increased shorting across the PEM even when the MEA is under compression. A membrane electrode assembly (MEA) is also provided comprising a gas diffusion layer that comprises a plain-weave carbon fiber cloth, and comprising a polymer electrolyte membrane (PEM) having a

15 thickness of 50 microns or less, where the membrane electrode assembly (MEA) has an electrical area resistance of 400 ohm*cm² or greater when compressed to 25% compression.